**IT Applications Unit 3, AOS 2, Organisations and Data Management**

**Structure and role of relational databases, p 101**

**Relational Databases:**

-Used by organisations with large amounts of data

-Software used to make these databases is called a **Relational Databases Management System or RDBMS**

**Describe the following relationships in a relational database.**

1. **One-to-one relationship**

A relationship in which a record in one table is connected to only one record in another table. E.g. an airline’s passenger details table will have many records about passengers, while a seat allocation table will contain records related to seats on that particular flight. The relationship between a passenger and their seat is a one-to-one relationship because each passenger has one seat and vice versa.

1. **One-to-many relationship**

One record in the first table is connected to more than one record in a second table. E.g. several workers in an office may share a single telephone extension. Each record in the “extension” table is related to several employees’ records.

1. **Many-to-many relationship**

Each record in the first table can be connected to many records in the second table. Whilst at the same time each record in the second table can be connected to a record in the first table. E.g. Student detail table and a subject detail table. Each student studies many subjects and each subject is studied by many students.

**Determining a RDBMS structure**

Need to determine which field in each database will be the primary key

The Primary key uniquely identifies each record in the data base. So therefore it will be a field that contains information that the other records do not and cannot contain. E.g. In a table with the column names “event’, “Year”, Winners name”, “Winners DOB”, The Event will be the primary key as it is unique to that record

1. What are the roles of foreign keys?

To ensure that enter data in one table that it has a corresponding value in another.

**Read the document, Primary keys/ Foreign keys**

1. describe the characteristics of a foreign key.

A foreign Key is a column in one table that links the data to a separate table. This is commonly used in a situation in which information from one table is needed in another but including the entire information in the table would be impractical.

What is meant by referential integrity?

The concept that all data within a database remains consistent. If You add a record to the table with the foreign key there must be a corresponding record in the other table.

**Table normalisation**

1. **What is the role of table normalisation?**

To give the database designer a tool to ensure that data integrity (Ensures that all data is a database is complete) is maintained. The rules of normalisation provide a systematic procedure to check for various faults and anomalies, by ensuring that the fields are in the correct tables.

1. **There are six “normal forms”, each rule applied successively from the first normal form, (1NF).**
2. **Describe the nature of the following three “normal forms”.**
   1. **First normal form, (1NF)**

States that each field and record intersection (cell) there is only one value, rather than a list of values. E.g. in a Stock database each products ‘Price’ field only contains one price, not a list of several prices.

* 1. **Second normal form, (2NF)**

When there is more than one primary key field in a table, each non-key field must be fully dependent on the key, not partially dependent. E.g. A table containing the names of students, their subjects and their year level. Year level is dependent on the student key for integrity, and not the subject field.

* 1. **Third normal form, (3NF)**

Every field in a table must relate directly to the primary key.

**Read the article, normalisation for more explanation of this process.**